UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,174	03/23/2004	Sanjeev K. Sharma	SAMINF.001A	4832

20995 7590 11/16/2005

KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

EXAMINER	
EKONG, EMEM	
ART UNIT	**PAPER NUMBER**
2688	

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/808,174	SHARMA, SANJEEV K.	
	Examiner	Art Unit	
	EMEM EKONG	2688	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 7,11, 12, 18, and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,950,658 B2 to James A. Minnick (Minnick) et al..

Regarding claims 1, 18, and 23, Minnick discloses a method, system and computer readable medium of load balancing in a terrestrial wireless communication system including an access node (col. 1lines 11-15, and col. 6 lines 37-49, a multiple channel controller that balances load), the method comprising: means (multi-channel controller) for communicating data wirelessly between the access node and a plurality of terminals via a plurality of channels, wherein the plurality of terminals and the access node form a wireless local area network (see figure 1, col. 2 lines 15-22, col. 2 lines 40-49,col. 4 lines 2-15, col. 4 lines 61-66, col.5 lines 42-51, and col. 5 line 62-col. 6 line 4, the multi-channel communication system includes multiple mobile units, several tower sites, a multi-channel controller, and several dispatch agencies).

means for determining (col. 12 line 6-8, load service) at the access node, an overloaded channel from the plurality of channels; and means for transferring (load service, col. 12 line 6-8), at the access node, a load from the overloaded channel to a less loaded channel of the plurality of channels (col. 2 line 40-col. 3 line 2, and col. 6 lines 35-52, the multi-channel controller determines TDMA channel loading and hands off selected mobile units from one channel to another when loading on a channel becomes excessive).

Regarding claim 7, Minnick discloses the method of claim 1, wherein the wireless communication system comprises one of the following: a IEEE 802.11a/11b/11g network, a wireless local area network (WLAN), a wireless personal area network (WPAN), a general packet radio service (GPRS) network, a global system for mobile communication (GSM) network, a code division multiple access (CDMA) network or a Bluetooth network (see figure 1, WLAN).

Regarding claim 11, Minnick discloses an apparatus for load balancing in a communication system including an access point, comprising: a control module (see figures 2 and 3, and col. 7 line 11-67, multi-agency router) configured to communicate data wirelessly between the access point and a plurality of terminals via a plurality of channels, wherein the plurality of terminals and the access point form a wireless local area network, determine an overloaded channel from the plurality of channels and transfer a load from the overloaded channel to a less loaded channel of the plurality of channels (col. 1lines 11-15, col. 6 lines 37-49, col. 2 lines 15-22, col. 2 lines 40-49, and col. 4 lines 2-15); and a memory (multi-channel controller database), in data communication with the

control module, configured to store information to be used for the control module performing the load balancing (see figure 3, and col. 7 line 67-col. 8 line 2).

Regarding claim 12, Minnick discloses the apparatus of claim 11, wherein the control module (multi-agency router) and the memory (multi-channel controller database) are embedded in the access point (see figures 2 and 3, col. 7 lines 11-27, and col. 7 line 40-col. 8 line 2).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 2-6, 9, 10, 14-17, and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minnick in view of U.S. Publication No. 2004/0052226 A1 to Ed H. Frank (Frank) et al.

Regarding claims 2 and 19, Minnick discloses the method of claim 1,

wherein the determining comprises: means for calculating (load service) loads of each of the plurality of channels (col. 10 line 44- 67, and col. 11lines 4-13, the load service calculates loading metric). Minnick discloses calculating loads based on at least one of the number of packets pending in each of the channels (col. 5 lines 9-17, and col. 6 lines 37-41 when one of the RNC/TDMA service channels on a multi-channel tower site becomes overloaded and can no longer support the requested polling rates for its assigned mobile units, a site balance may be performed); means for determining (load service) the overloaded channel from the plurality of channels based on the calculated loads; and means for selecting (load service) a link from the overloaded channel (see figure 5, col. 6 lines 41-44, col. 9 line 63-col. 10 line 19, col. 11 lines 4-13, col. 11 lines 56-62, and col. 12 lines 7-35, when an overload condition is reached the load service determines an alternate channel at the current tower site that has a better loading metric).

However, Minnick fails to disclose calculating load based on bandwidths which are currently being used in each of the channels.

Frank discloses calculating load based on bandwidths which are currently being used in each of the channels (pars. 0048, 0051, and 0052, bandwidth information are utilized for bandwidth and load management).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Minnick, by calculating load based on bandwidths which are currently being used in each of the channels as taught by Frank for the purpose of data throughput.

Regarding claims 3, 6, 20, and 22, Minnick discloses the method of claims 1, 2, and 19, however, Minnick fails to specifically disclose wherein the transferring is performed in case the quality of service level required for the selected link is met in the less loaded channel (claims 3 and 20); and

determining a received signal strength indication (RSSI) value in the less loaded channel and wherein the transferring is performed if the determined RSSI value is equal to or greater than that of the RSSI value of the selected link, or greater than a threshold RSSI value (claims 6 and 22).

Frank discloses transferring means (switch) is performed in case the quality of service level required for the selected link is met in the less loaded channel and means for determining (switch) a received signal strength indication (RSSI) value (reads on claims 3, 6, 20, and 22) (pars. 0085-0088, Qos and load balancing controller use Qos and signal strength parameter information for load balancing).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Minnick, by transferring is performed in case the quality of service level required for the selected link is met in the less loaded channel, and determining a received signal strength indication (RSSI) value in the less loaded channel and wherein the transferring is performed if the determined RSSI value is equal to or greater than that of the RSSI value of the selected link, or greater than a threshold RSSI value as taught by Frank for the purpose of handing off an access node to a channel with better quality of service and higher RSSI value.

Regarding claims 4, Minnick discloses the method of claim 2, wherein the transferring comprises swapping the selected link of the overloaded channel with a link of the less loaded channel (col. 12 lines 25-35).

Regarding claims 5 and 21, Minnick discloses the method of claims 2, and 19, wherein the selecting means configured to select the least (load service) loaded link from the overloaded channel (Minnick, col. 2 line 65-col. 3 line 2, handing off the mobile units from one communications channel to another (least loaded) communications channel when loading on the first communications channel becomes excessive).

Regarding claim 9, Minnick discloses a method of load balancing in a wireless communication system including an access point (col. 1 lines 11-15, and col. 6 lines 37-49, a multiple channel controller that balances load). Minnick discloses providing a plurality of channels between the access point and a plurality of terminals such that the access point is in data communication with the plurality of terminals via the plurality of channels (col. 2 lines 15-22, col. 2 lines 40-49,and col. 4 lines 2-15).

Minnick discloses determining an overloaded channel from the plurality of channels based on at least one of: the number of packets pending in each of the channels (see figure 5, col. 6 lines 41-44, and col. 9 line 63-col. 10 line 19).

However, Munnick fails to disclose calculating based on bandwidths which are currently being used in each of the channels; and selecting a link from the overloaded channel; and selecting a link from the overloaded channel; and transferring the selected link to a less loaded channel of the plurality of channels

based on at least one of: the quality of service level required for the selected link and a received signal strength indication (RSSI) value in the less loaded channel.

Frank discloses calculating based on bandwidths which are currently being used in each of the channels (pars. 0048, 0051, and 0052, bandwidth information are utilized for bandwidth and load management)

Frank discloses transferring the selected link to a less loaded channel of the plurality of channels based on at least one of: the quality of service level required for the selected link and a received signal strength indication (RSSI) value in the less loaded channel (pars. 0085-0088, Qos and load balancing controller use Qos and signal strength parameter information for load balancing).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Minnick, by calculating based on bandwidths which are currently being used in each of the channels and selecting a link from the overloaded channel; and transferring the selected link to a less loaded channel of the plurality of channels based on at least one of: the quality of service level required for the selected link and a received signal strength indication (RSSI) value in the less loaded channel as taught by Frank for the purpose of maximizing data rate.

Regarding claims 10 and 17, Minnick discloses a method and system of load balancing in a wireless communication system including an access point, the method comprising: communicating data between the access point and a plurality of terminals via a plurality of channels (col. 1lines 11-15, col. 6 lines 37-49, col. 2 lines 15-22, col. 2 lines 40-49, and col. 4 lines 2-15).

Minnick discloses calculating loads of each of the plurality of channels based on at least one of: the number of packets pending in each of the channels (see figure 5, col. 6 lines 41-44, and col. 9 line 63-col. 10 line 19, and col. 11 lines 4-13); and determining an overloaded channel from the plurality of channels based on the calculated loads (col. 11 lines 4-13, and col. 11 lines 56-62);

Minnick discloses selecting a link from the overloaded channel; selecting a new channel, to which the selected link is transferred, from the plurality of channels, wherein the new channel is less loaded than the overloaded channel (col. 11 line 56 - col. 12 line 35).

However, Munnick fails to specifically disclose calculating based bandwidths which are currently being used in each of the channels; and determining the quality of service level required for the selected link and a received signal strength indication (RSSI) value in the new channel; and transferring the selected link to the new channel in case the determined RSSI value is equal to or greater than that of the selected link or greater than a predefined threshold RSSI value, and in case the quality of service level required for the selected link is met in the new channel.

Frank discloses calculating based bandwidths which are currently being used in each of the channels (pars. 0048, 0051, and 0052).

Frank discloses determining the quality of service level required for the selected link and a received signal strength indication (RSSI) value in the less

loaded channel (pars. 0085-0088, Qos and load balancing controller use Qos and signal strength parameter information for load balancing).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Minnick, by calculating based bandwidths which are currently being used in each of the channels and determining the quality of service level required for the selected link and a received signal strength indication (RSSI) value in the new channel; and transferring the selected link to the new channel in case the determined RSSI value is equal to or greater than that of the selected link or greater than a predefined threshold RSSI value, and in case the quality of service level required for the selected link is met in the new channel as taught by Frank for the purpose of maximizing signal throughput.

Regarding claim 14, Minnick discloses the apparatus of claim 11, wherein the control module (see figure 2, multi-agency router) is further configured to calculate loads of each of the plurality of channels based on at least one of the number of packets pending in each of the channels determine the overloaded channel from the plurality of channels based on the calculated loads and select a link from the overloaded channel (col. 9 line 63-col. 10 line 23).

However Minnick fails to disclose calculating loads based on bandwidths which are currently being used in each of the channels

Frank discloses calculating loads based on bandwidths which are currently being used in each of the channels (pars. 0048, 0051, and 0052).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Minnick, by calculating loads based on bandwidths which are currently being used in each of the channels as taught by Frank for the purpose of better channel utilization.

Regarding claims 15 and 16, Minnick discloses the apparatus of claim 14, however, Minnick fails to specifically disclose wherein the control module is further configured to transfer the load in case the quality of service level required for the selected link is met in the less loaded channel (claim 15);

determining a received signal strength indication (RSSI) value in the less loaded channel and to transfer the load if the determined RSSI value is equal to or greater than that of the RSSI value of the selected link, or greater than a predefined threshold RSSI value (claim 16).

Frank discloses the quality of service level required for the selected link and determining a received signal strength indication (RSSI) value (reads on claims 3 and 6) (pars. 0085-0088, Qos and load balancing controller use Qos and signal strength parameter information for load balancing).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Minnick, and have the control module is further configured to transfer the load in case the quality of service level required for the selected link is met in the less loaded channel and determining a received signal strength indication (RSSI) value in the less loaded channel and to transfer the load if the determined RSSI value is equal to or greater than that of the RSSI value of the selected link, or greater than a

predefined threshold RSSI value as taught by Frank for the purpose of load management.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Munnick in view of U.S. Publication No. 2003/0181211 A1 to Javad Razavilar (Razavilar) et al..

Regarding claim 8, Minnick discloses the method of claim 1, wherein the access node includes a plurality of access nodes (see figure 1). However, Minnick fails to disclose each access node performs the determining and transferring independently from each other.

Razavilar discloses each access node performs the determining and transferring independently from each other (pars. 0107, and 0108, signal strength measurements are utilized for establishing channel metrics and ranking the available channels so that a given AP can decide which is the best available channel to utilize).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Minnick, and have each access node performs the determining and transferring independently from each other as taught by Razavilar for the purpose of each access point compare and chose channels independently based of channel calculated metric.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Munnick in view of U.S. Publication No. 20050026624 A1 to Asif D. Gandhi (Gandhi) et al..

Regarding claim 13, Minnick discloses the apparatus of claim 11, and multi-channel controller, however, Minnick fails to specifically disclose wherein the access point comprises a multi channel medium access control (MC-MAC) based access point.

Gandhi discloses MAC access point (see par. 0055).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Minnick, and have the access point comprises a multi channel medium access control (MC-MAC) as taught by Frank for the purpose of using an access point with multi channel medium access control.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to load balancing:

U.S. Pat. No. 5754959 to Makoto Ueno et al.

U.S. Pub. No. 20040081144 A1 to Richard Martin

U.S. Pat. No. 4670899 to Brody et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EMEM EKONG whose telephone number is 571 272 8129. The examiner can normally be reached on 8-5 Mon-Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Eng can be reached on 571 272 7495. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

EOE
11/04/05

NICK CORSARO
PRIMARY EXAMINER